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FARMERS' BULLETIN 1183

UNITED STATES DEPARTMENT OF AGRICULTURE

rev. Feb. 1922

THE CARE OF LEATHER



This bulletin contains suggestions for a judicious selection of articles made from leather and tells how to care for them in order to obtain the maximum service.

Contribution from the Bureau of Chemistry

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Washington, D. C.

Issued December, 1920
Revised February, 1922

THE CARE OF LEATHER.

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INTRODUCTION.

FOR several years the supply of leather in this country has barely met the demand, even with an annual importation of hides and skins nearly equal to the domestic supply. The people of the United States buy about 300,000,000 pairs of shoes a year. Their needs could be supplied by 250,000,000 pairs, if they were well cared for and kept in repair. As a rule the farmer uses his harness for less than 10 years. If the right kind of attention were given to its manufacture and use, it should last for 20 years or longer. Belts for driving machinery often become impaired, if not useless, within a few years, even on straight drives. A good leather belt, suited to the work to be done and properly installed, will run for from 10 to 30 years.

Every pair of shoes, every machine belt, and every piece of harness that is allowed to go to waste or that is not made to yield full service must be needlessly replaced by other leather, thus keeping prices high. Including leather made from imported hides, the leather supply in this country is large enough to provide everyone with an average of two or even two and one-half pairs of shoes a year and to keep them in repair, as well as to replace all harness and machine belts every 10 or 20 years, at reasonable prices. It is doubtful, however, whether the leather-making materials produced here, supplemented by those which can be imported, will suffice to meet the demand for three or more pairs of shoes a year for each person, for a new harness

every 2 or 5 years, and for new machine belts every 5 or 10 years, which is now too frequently the requirement.

The suggestions and directions given in this bulletin, if followed by the public, will go far toward conserving the supply of leather, and will materially reduce the individual expenditures for leather goods.

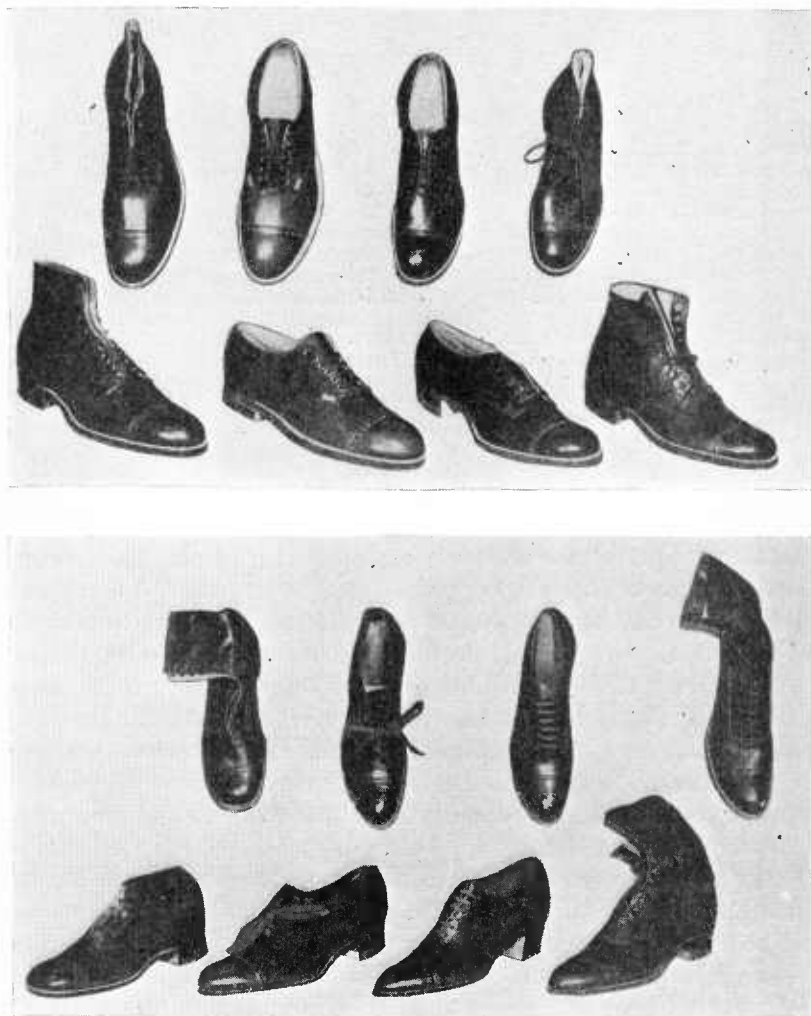


FIG. 1.—Attractive Shoes of Good Shape.

They combine comparatively straight inner lines, rounded toes, heels of medium height, and moderately thick soles, all of which make for greater serviceability, comfort, and safety.

BOOTS AND SHOES.

The wasting of a single shoe a year by each person in the United States costs the country at least \$250,000,000 annually, at the present prices.

SELECTION.

The frequent occurrence of such troubles as corns, bunions, overriding and hammer toes, fallen arches, and calloused, swollen, and aching feet indicates that too often insufficient care is given to the selection of shoes. Feet which are forced into shoes that are too

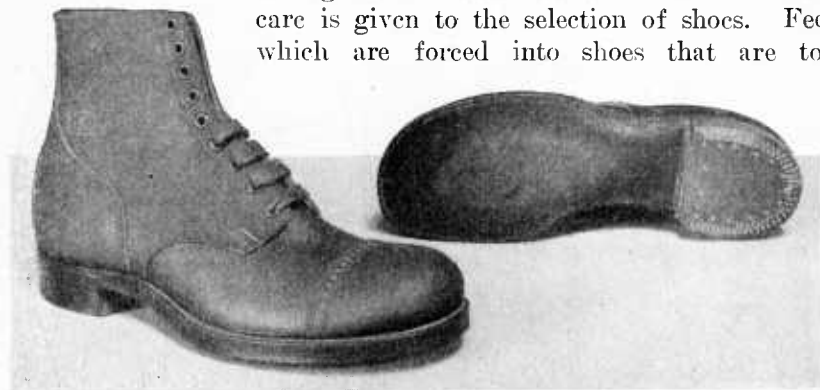


FIG. 2.—Shoes for Every-day Wear.

A serviceable type, insuring maximum comfort and efficiency for the wearer, and well adapted for use in city and country alike. After a thorough study the War Department adopted this style of shoe for the U. S. Army.

small for comfort or fail to conform to the natural shape of the foot are cramped and twisted and, if such shoes are worn continuously, the bones become deformed, as shown in figure 4. Though it is possible now to buy footwear which combines the proper shape with an attractive appearance and good quality of material (fig 1), a more universal demand for such shoes will increase the supply. These shoes are more comfortable and more serviceable than those which do not conform to the natural shape of the foot, and, aside from giving bodily ease and longer wear, they save money which might otherwise be required for the alleviation of foot troubles.

Feet which have become distorted by improperly fitting shoes may need remolding by a series of gradual changes. The habitual wearer of high heels probably will find low heels uncomfortable for a week or so, because such heels bring into service muscles which have long been inactive, while relieving the strain on others trained to balance the body in an unnatural position. Likewise, it may be more satisfactory to go by easy stages from a narrow, pinching toe to one that will permit the foot to spread out to its natural size,

Shoes with heels which throw the wearer's weight upon the toes or are too small to support solidly the weight of the body lose their attractive appearance and their serviceability much more quickly than those with heels which permit the feet to maintain their normal position in standing and walking. Heels which are too small or too high or are placed forward under the foot have a tendency to become worn down on one side, which causes excessive strain on the seams and uneven wear on both the soles and uppers. Of more

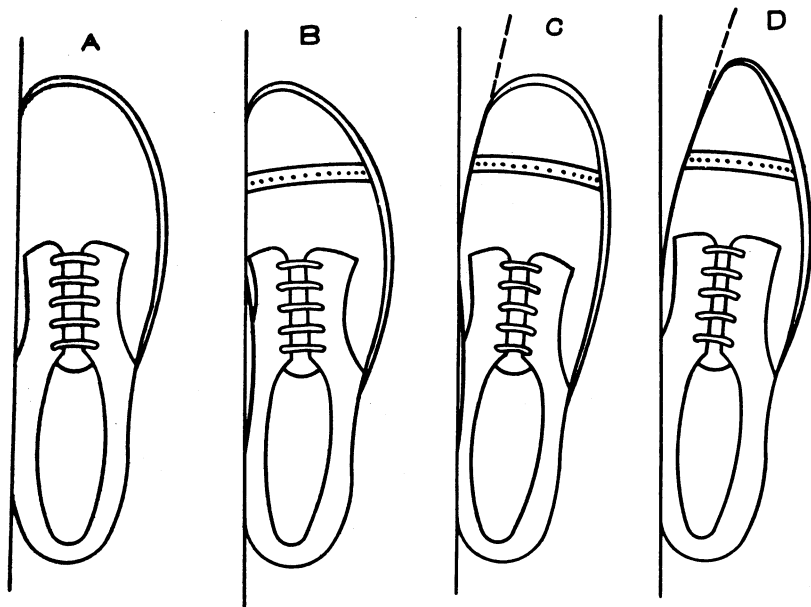


FIG. 3.—Comparison of Shoes Made on Proper and on Improper Lines.

A and B—Satisfactory. Note the straight inner line and rounded toe characteristic of the normal foot. *C and D*—Objectable. Note the curve outward from the naturally straight inner line of the foot; also the too pointed toe *D*. (Photograph from the Army Medical Museum.)

importance, however, is the fact that such heels are a constant menace to the health of the wearer, and frequently cause serious injury through slipping and falling. Rubber heels, the use of which has become very general, are often advisable for wear in the city, where they lessen the jar in walking, and, as a rule, last longer than leather heels.

If the soles of shoes designed for ordinary use are sufficiently thick they protect the feet against injury from uneven surfaces, give comparatively long service, and help to maintain the shape of the shoe. Thin or soft soles may cause the feet to become calloused, bruised, or strained, and afford little protection to the wearer in wet weather.

Welt shoes can be resoled or half soled by sewing more easily and neatly than other kinds. In this type of shoe, a strip of leather

called the welt is used to join the soles to the upper. The welt is sewed to the inner sole and upper along its inner edge and to the outer sole along its outer edge. It should extend for at least a quarter of an inch beyond its juncture with the upper, and preferably should be smooth. Narrow welts and welts finished by wheeling (fig. 6) often break and make repairs difficult and expensive.

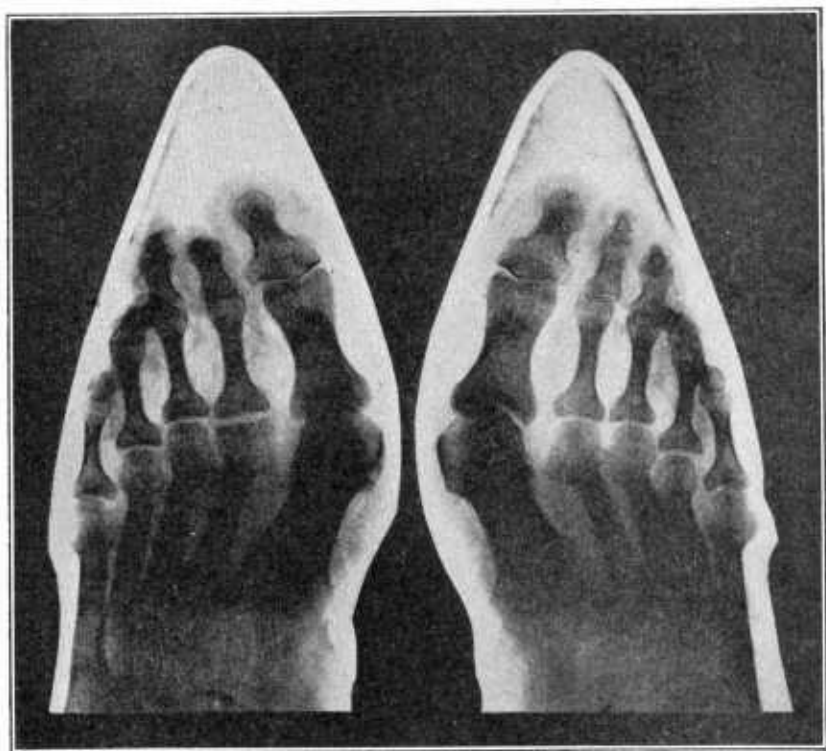


FIG. 4.—Effect of Shoes on the Bones of the Foot.

The bones of the foot bent into unnatural and often painful positions by improperly shaped and ill-fitting shoes. (Photograph from Army Medical Museum.)

CARE.

Proper care of shoes means a reduction in shoe bills of from 25 to 50 per cent, and at the same time insures good-looking footwear. An economical plan is to have two pairs which are worn on alternate days, thus permitting each pair to become thoroughly dry between the periods of wearing them. Shoe trees are of great assistance in retaining the original shape of the shoe. Shoes designed for farm or other heavy out-of-door work should be kept clean and greased, while those for street wear should be kept clean and polished.

Send your boots or shoes to the shoemaker for repairs the minute they begin to rip at the seams, the upper leather cracks through at a crease, a heel becomes twisted out of shape, or the heel lift wears through. Especially avoid wearing away the welt. Delay may mean that the shoe soon will be so badly damaged that it is no

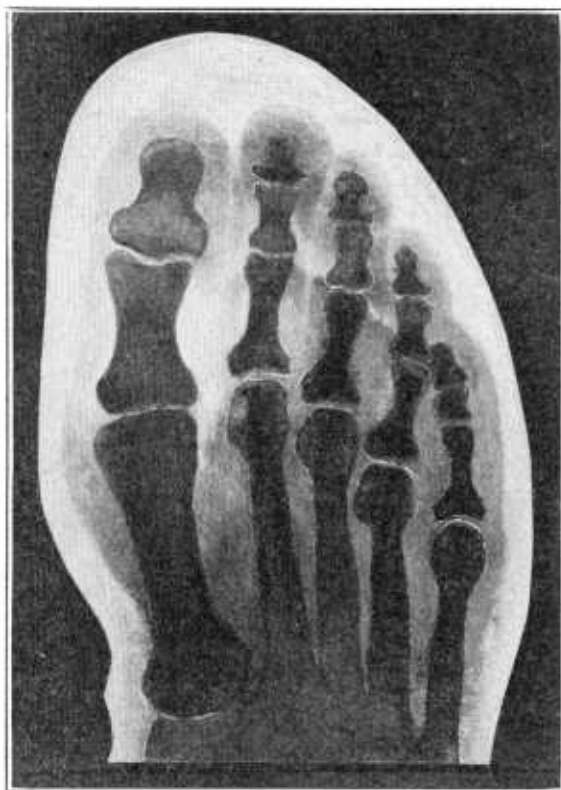


FIG. 5.—Effect of Shoes on the Bones of the Foot.

The nearly normal bone structure of a foot in a correctly shaped and properly fitting shoe. (Photograph from Army Medical Museum.)

longer worth repairing, and from \$2 to \$5 has been lost by neglect (figs. 7 and 8).

Ripped seams in the uppers can frequently be stitched at home, and a handy man, with the aid of a repair kit, can put on new heel lifts, rubber heels, half soles, and metal heel or toe plates without much difficulty. The equipment necessary for repairing shoes includes a last holder, three or four iron lasts of different sizes, a shoemaker's hammer, a pair of pincers, one or two leather knives, a leather rasp or file, awls, nails for soles and heels, flax shoe

thread, bristles, and wax. Made-up repair kits containing all the necessary articles, or the separate articles, can be purchased from dealers in hardware or shoe findings. Waxed linen or flax thread should always be used for sewing, the flax being stronger and more durable than cotton, and the wax making the thread more water-resistant and the stitch holes more impervious to water.

DRYING.

Boots and shoes are peculiarly subject to damage after they have become soaking wet while being worn. The wet leather is soft and therefore readily stretches out of shape. The stitches cut through wet leather much more easily than through dry leather, and wet soles and heels wear away rapidly.

Great care must be taken in drying wet boots and shoes, for they often burn before it seems possible. If wet leather, which burns much more readily than dry leather, becomes hotter than the hand can bear, it is almost sure to burn. Moreover, if dried too fast and without sufficient attention, the shoes shrink, becoming hard and misshapen.

To dry wet boots and shoes properly, first wash off all adhering mud and grit with tepid water, and, in the case of work or rough shoes, at once oil or grease them with one of the preparations described on page 12. Then straighten the counter heel, vamp, and

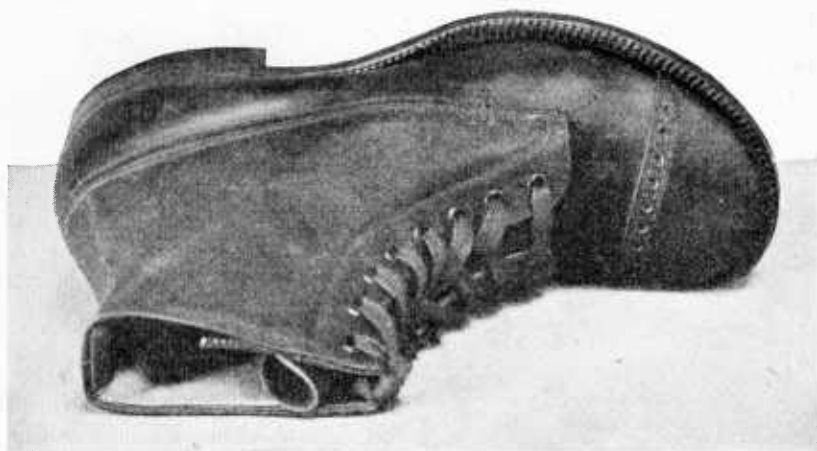


FIG. 6.—Shoe with Wheeled Welt.

These corrugations, produced by "wheeling," weaken the welt and render defective stitching less apparent.

top to the correct shape, and stuff the shoes with crumpled paper, which helps to hold the shape and shortens the drying period. Finally, set the shoes aside in a place that is not too warm and allow them to dry slowly. The shoes should not be worn until they have become thoroughly dry.

OILING AND GREASING.

The rational use of suitable oil or grease greatly increases the endurance of shoe leather. Boots and shoes, especially those worn on the farm, in the forest, and in mines, should be oiled or greased whenever the leather begins to harden or dry, or when it does not turn water well. The purpose of doing this is to make the boots last longer, and to keep the feet dry and comfortable.

Before oiling or greasing, brush the boots or shoes thoroughly to remove all the dirt and dust, warm them carefully, bearing in mind the danger of burning them if they are wet, and apply warm oil or grease with a swab of wool or flannel. The oil or grease should

never be hotter than the hand can bear, and it should be rubbed well into the leather, preferably with the palm of the hand. Special care should be taken to work the grease in well where the sole is fastened to the upper, as the water soaks in most frequently at that place. After being greased the shoes should be left to dry in a warm, but not hot, place.

Among the best materials for this purpose are neat's-foot, cod, and castor oils, tallow, and wool grease, or mixtures of them. Cylinder oil and vaseline or petrolatum also are good, but are improved by being mixed with animal oils or greases. The application of any oil or grease darkens light-colored or russet leather. Where this is objectionable the shoes should be kept in good condition by frequent polishing.

Castor oil probably is the most satisfactory oil for use on shoes

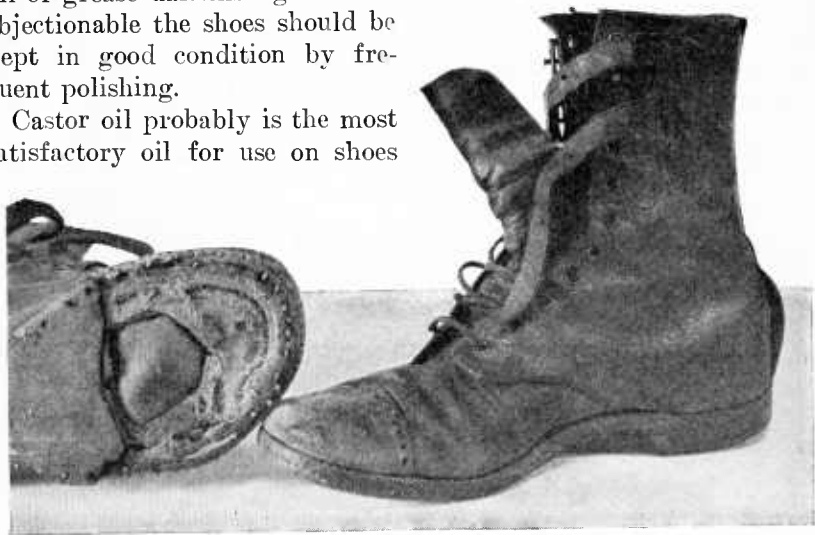


FIG. 7.—Repairing always should be done in time, certainly before the welt and insole become worn. Ordinarily it does not pay to repair shoes like these.

that are to be polished. Apply the oil lightly to the clean, dry shoe, and rub it into the leather until dry. If the application is light the shoe may be polished immediately, although it is better to wait until the next morning. Too heavy an application makes it difficult to polish the shoes satisfactorily, even after two or three trials.

WATERPROOFING.

The ideal shoe would permit the perspiration from the foot to pass out, at the same time preventing the entrance of water. Such a shoe, however, does not exist.

Dependence for keeping the feet dry must, then, be placed on rubber overshoes and boots or waterproofed leather shoes and boots. Although rubber overshoes and boots keep water out, they also keep the perspiration in. Moreover, they are cold in winter and hot in summer. For these reasons, as well as because of excessive weight, rubber footwear is objectionable to many people.

Some boots which are well made of the best quality leather and which are properly treated are practically waterproof under most conditions of wear. Nearly all of the leather shoes and boots made nowadays, however, even when treated to make them water-resistant, allow the entrance of some water, owing principally to the difficulty of completely waterproofing the seams. Such footwear can not be expected to keep the feet perfectly dry if worn for a long time in wet weather, nor will it take the place of rubber overshoes or boots for walking in water, slushy snow, or very soft mud. Nevertheless, waterproofed leather boots and shoes are very satisfactory for protecting the feet during rain or snowstorms and for use on wet pavements or wet ground where there are no

deep puddles. They

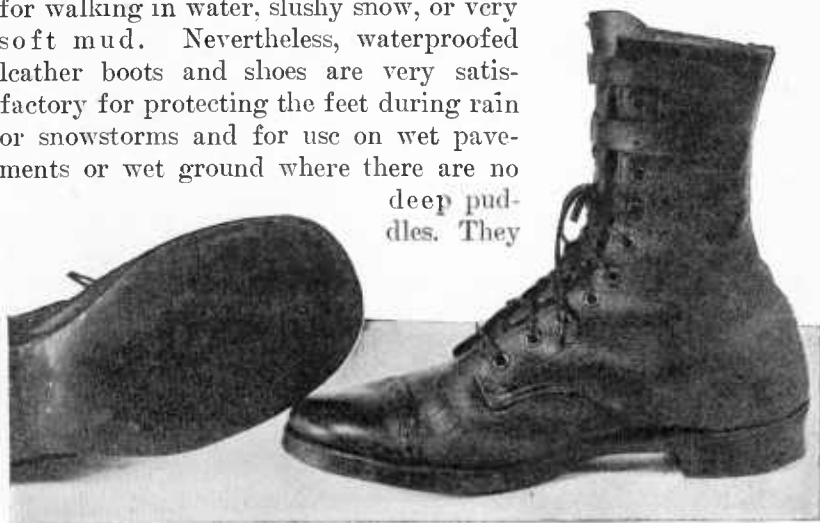


FIG. 8.—Nevertheless, for \$2 these shoes were put into excellent shape and were worn for another three months.

also keep the perspiration in, but are less objectionable than rubber in this respect.

As already stated, applications of oil or grease to light-colored and russet leather darken it and make all leather difficult to polish. Where this is an objection, only the soles of the shoes need be waterproofed. The uppers can be made fairly water-resistant by frequently applying a good wax polish. The occasional use of castor oil on uppers increases their water-resistance, flexibility, and durability, without greatly detracting from their ability to take a polish. If the oil is applied lightly to a clean, dry surface and rubbed in until the leather is dry, the shoes may be polished immediately, although better results are obtained by waiting until the next day. If the oil is applied too heavily, it is difficult to polish the shoes and the shine will not last long. The best method is to pour a little oil on a piece of felt or cheesecloth, work in the hands until the oil is thoroughly distributed, and then rub the cloth lightly and evenly over the leather.

The grease used for waterproofing shoes and boots in summer should be harder than that used in winter. Since heavily greased shoes have a tendency to cause the feet to perspire and swell in hot weather, and there is also less need for waterproofing in summer than in winter, it is rarely advisable to put as much grease on the shoes at that time of the year. In summer, the quantity of

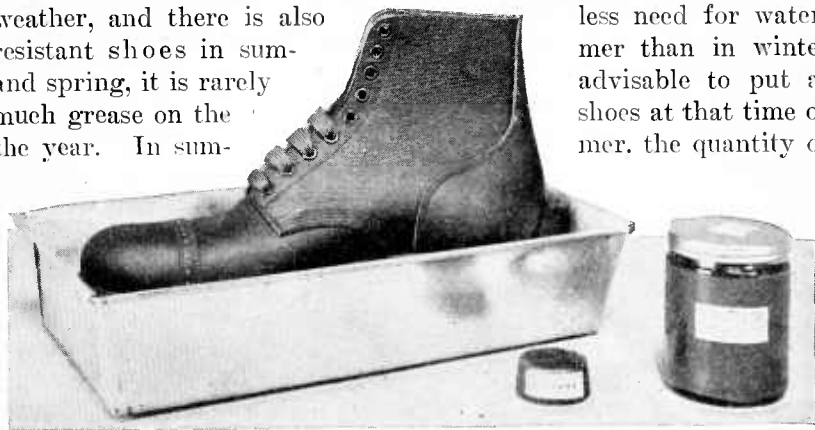


FIG. 9.—All You Need for Waterproofing Shoes.

grease used should not exceed the quantity that the leather will take up without leaving its surface greasy. In winter, especially if the maximum water-resistance is desired, a mixture of grease and oils which is not too hard when cold is required. More of this grease than the leather will absorb may be used. An excess does no harm and makes the leather more water-resistant.

WATERPROOFING FORMULAS.

For waterproofing boots and shoes, nothing better than the following simple formulas is known to the Department of Agriculture. While the department believes that these formulas infringe on no existing patents or pending applications for patents, it can assume no responsibility in the matter.

Formula 1.

Neutral wool grease	ounces	8
Dark petrolatum	do	4
Paraffin wax	do	4

Formula 2.

Petrolatum	pound	1
Beeswax	ounces	2

Formula 3.

Petrolatum	ounces	8
Paraffin wax	do	4
Wool grease	do	4
Crude turpentine gum (gum thus)	do	2

Formula 4.

Tallow	ounces	12
Cod oil	do	4

In each case melt the ingredients of the mixture together by warming them carefully and stirring thoroughly. Better penetration is obtained if the grease is applied warm, but it should never be hotter than the hand can bear.

Grease thoroughly the edge of the sole and the welt, as this is where shoes leak most, and completely impregnate the sole with the grease. The sole can be most conveniently waterproofed by letting the shoe stand for about 15 minutes in a shallow pan containing enough of the melted waterproofing material to cover the entire sole. Rubber heels, however, should not be allowed to stand in the grease, as it softens the rubber.

POLISHING.

Most of the modern shoe polishes consist of mixtures of waxes colored with dyes and softened to a pasty consistency, usually with turpentine. Others which contain no turpentine are made from an emulsified mixture of waxes, formed by boiling them with a solution of borax or soda, colored with dye or finely pulverized bone charcoal, and mixed either with a solution of ordinary soap to form a paste or with a solution of castile soap to form a liquid. Some liquid polishes consist of shellac, waxes, and dye in alcohol solution.

The general belief that the presence of turpentine in shoe polishes is injurious to leather is not borne out by experiments on various polishes of this kind. The turpentine in polishes sometimes becomes rancid, acquiring a sharp, disagreeable odor and making the polish gummy. Such polishes give less satisfactory results than those in which the turpentine is sweet.

Polishes which contain free acid or alkali may be harmful. Some polishes of the emulsion type which contained free alkali, examined in the laboratory, caused cracking of the vamps where the shoe is most often bent. Liquid cleaners which contain oxalic acid, often put up in combination with paste polishes for use on light-colored shoes, usually injure leather. It is possible to detect the presence of free acid or alkali, in a polish which does not contain water-soluble dye, by stirring up some of the polish with warm rain water and testing the clear water after settling with red and blue litmus paper. A change from red to blue indicates free alkali, while a change from blue to red indicates free acid. If the polish contains water-soluble dye, free acid and alkali can be detected only by chemical analysis.

HARNESS.

According to the reports received by the department, many farmers obtain excellent service from their harness for 25 years (fig. 10), but many others are unfortunately unable to use theirs for more than

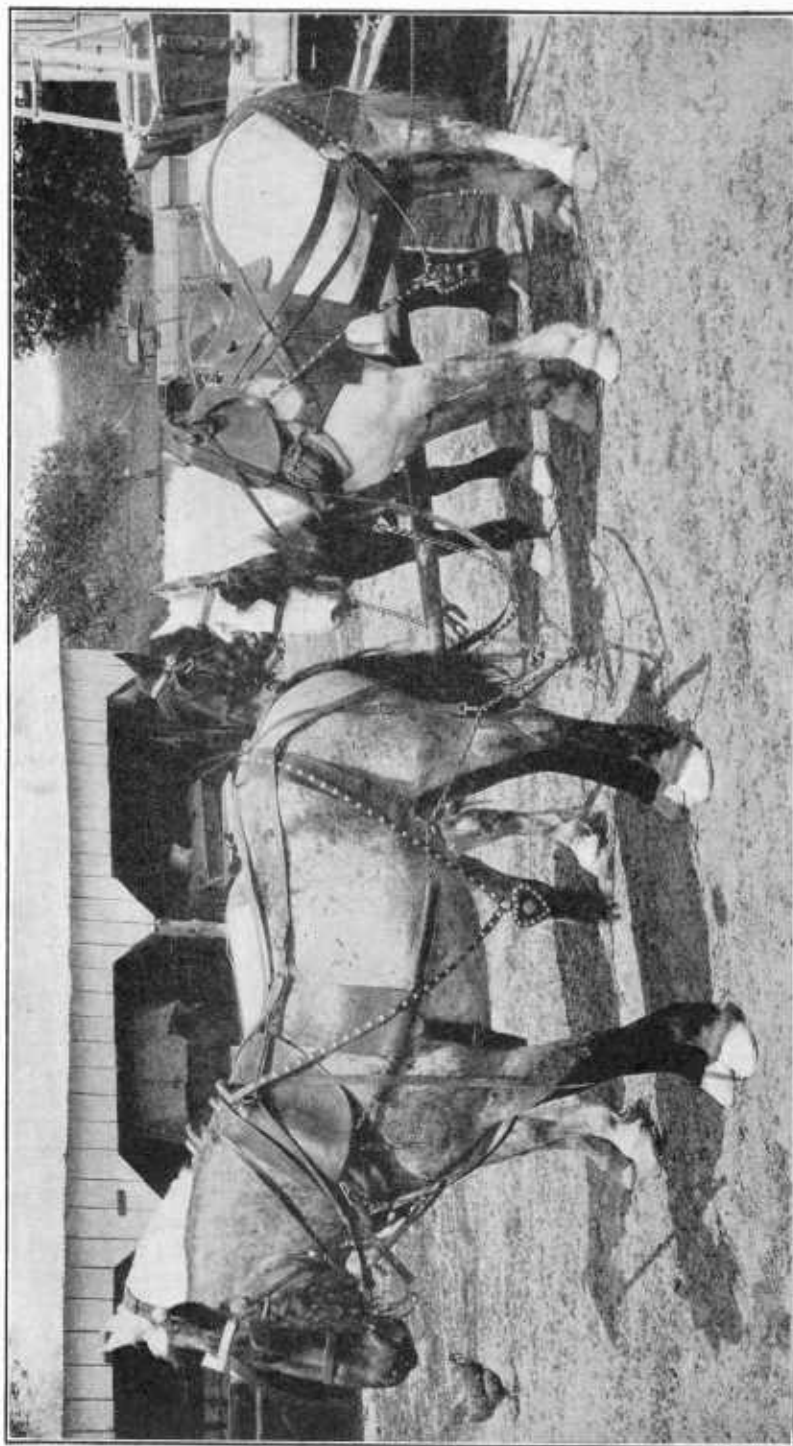


FIG. 10.—Harness Used on a Farm for 34 Years.

It has been kept clean and oiled frequently with neat's-foot oil. As a result, it shows no signs of deterioration and should last for 20 years longer. Proper selection and care did it.

from two to five years. This shows the importance of careful selection and care.

SELECTION.

In selecting harness see that it is well made. Make sure especially that the reins, breeching, holdback straps, tugs or traces, belly bands, and yoke straps are sufficiently heavy and strong for the work required. A runaway team can not be controlled with weak reins, nor will weak tugs and straps stand heavy work.

New harness that shows cracks on the grain side when the leather is sharply bent in any portion is worthless, and the presence of cracks in old harness proves that it is deteriorating and will soon fail if subjected to heavy loads.

Since strong acids prove injurious to leather in time, it is to the purchaser's best interest to buy harness which does not contain such materials. Grease in moderate quantities, up to 20 per cent, protects, preserves, and strengthens harness leathers. More than 25 per cent is not necessary.

It is more economical to buy harness that is too heavy than to buy that which is too light for the work.

CARE.

Neglect of harness results in injury that greatly lessens its durability. The sewing, which should have been done with strong waxed linen thread, must be kept in good condition. All buckles should remain solidly in place. It is advisable to wash and oil harness frequently.

For washing, use tepid water, a neutral soap, such as castile or white toilet soap, and a sponge or fairly stiff brush. Hardened grease is very conveniently removed by scraping with a dull knife. Rinse in clean, tepid water, and allow the harness to hang in a warm place until it is no longer wet, but still damp. Then oil it and leave it in a warm place for 24 hours before using it. Harness should be oiled or greased while still damp; otherwise, it may take up so much grease that it will pull out of shape or take up sand and grit, which will injure it, as well as spoil its appearance. Harness should never look or feel greasy.

For driving harness neat's-foot or castor oil or a mixture of these with wool grease is good, and for heavy harness a mixture of tallow and cod oil, neat's-foot oil and tallow, or any or all of these with wool grease, to make a paste having about the consistency of butter. Apply the grease lightly to driving harness and liberally to work harness. Rub the oil or grease, warm to the hand, thoroughly into the leather while it is still damp from the washing. After the harness has hung in a warm room overnight, remove, with a clean, dry cloth, the excess of oil which the leather is unable to take up.

If the oils and greases mentioned are too expensive or too difficult to obtain, they may be mixed with not more than an equal quantity of heavy mineral oil, petrolatum, or paraffin, or a mixture of these substances.¹ The use of any grease or other preparation containing mineral acids or oxalic acid hastens the rotting of the leather.

Should any part of your harness break under circumstances that indicate leather of poor quality, you are asked to send about 1 foot of the broken strap to the Bureau of Chemistry, United States Department of Agriculture, Washington, D. C., with a full and careful statement as to how long you have had the harness, what care you have given it, and the conditions under which it broke.

DRIVING BELTS.

Kept in good operating condition, a belt will run for from 10 to 25 years or longer, provided, of course, it is made from good materials and is adapted to the use to which it is put (fig. 13).

SELECTION.

Leather best suited for belting is cut from the section of the hide which extends for from 15 to 18 inches on each side of the backbone and from the root of the tail for about 48 or 50 inches toward the shoulder. This area is known as center stock. Leather from other sections of the hide, while strong, is more stretchy and less durable than the center-stock leather, and can not be expected to give as long service.

In selecting a belt for driving machinery the character and continuity of the work expected of it should be taken into account. The selection of the proper belt for a given installation involves consideration of load, width, thickness, length, speed, ply, size of pulleys, and horsepower. Ordinarily the competent belt maker's advice as to a suitable belt for a given installation should be followed.

It is more economical to use a belt that is too wide than one that is too narrow. If the belt is not suited to the work it gives trouble continually, causing shutdowns of machinery that will quickly cost more in loss of time and wages than many good belts.

A belt should be sufficiently flexible to cling closely to the smallest pulley over which it passes; otherwise it is not adapted to the work, and, in addition to causing loss of time from frequently running off, it may crack on the grain within a short time, which weakens it and causes it to stretch (figs. 11 and 12). Furthermore, it will slip on the pulley, thus losing power and becoming heated, which hastens its deterioration. A belt should run slack rather than tight.

¹ Castor oil will not mix well with mineral waxes, such as petrolatum or paraffin.

When new, a good belt evidently contains grease but is not greasy. It is flexible and feels firm, mellow, and smooth.

A high glossy finish causes the belt to slip until it is worn off, and in slipping it is heated, possibly burned. An oil finish is desirable, but the manufacturer seldom ships belts thus finished for the reason that oil darkens them, thus adversely affecting their sale, in spite of the fact that color is of no essential value. For the sake of a light color, therefore, belts are deprived of a final touch which would make them more pliable and keep them in prime condition for a comparatively long time. Uniform light colors and glossy finishes are often obtained at a sacrifice of valuable properties.

"Shimming," or the introduction of thin strips of leather between plies of a double or triple belt to bring it to uniform thickness, is

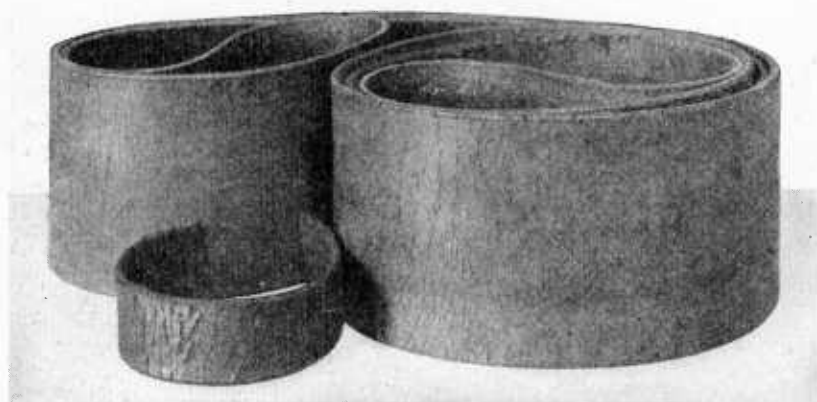


FIG. 11.—Result of Lack of Care or of Poor Quality of Leather Belting.

Carelessness causes belts and straps quickly to become cracked and weak, which results in much annoyance and delay from frequent breaking.

open to the objection that it adds extra cemented joints, any one of which may come apart and seriously interfere with the running of the belt. Proper selection of strips and overlapping of joints make shimming unnecessary. Obviously a belt is no stronger than its weakest joint. With good material and careful workmanship a joint may be practically as strong as the rest of the belt.

CARE.

Adequate service can not be expected from a belt that slips, does not run true, is not properly laced, is run too loose or too tight, is subjected to rapidly alternating light and heavy loads, is alternately wet and dry, is run on pulleys that are not true or are too small for its weight and thickness, or is neglected and allowed to deteriorate for lack of grease. An effort should be made to keep a good belt in its original condition, and prevent it from becoming hard and harsh,

Once a belt loses its original good properties, no amount of artificial dressing can fully restore them. Keep the belt clean and free from excess of grease and belt dressings. Unless frequently wiped off, dust and dirt work into the belt and damage it. Never let the belt remain dirty or dusty overnight, or leave an excess of grease or oil on it. Belts to be stored should be placed on open shelves in a well-ventilated room.

BELT DRESSINGS.

In service a belt gradually loses a portion of its lubricating material, so that, unless this is renewed at suitable intervals, its durability is impaired. A good belt grease or dressing gives the belt sufficient flexibility and at the same time causes it to cling to the

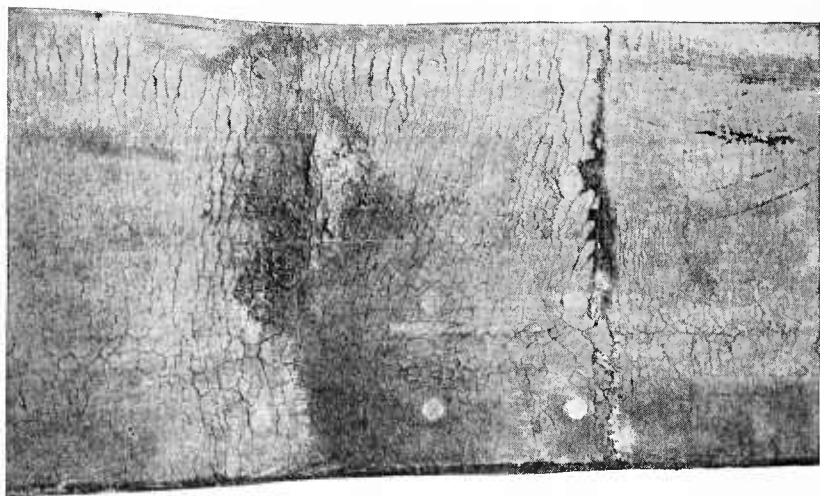


FIG. 12.—Result of Inattention and Poor Installation of Belting.

Unless kept clean, mellow, and in good condition with suitable belt dressings, a belt will soon look like this.

pulley, but does not subsequently stiffen or injure it in any way. Among the best belt dressings are mixtures of cod and neat's-foot oils with tallow and wool grease, free from mineral acid.

Clean the belt well, especially on the pulley side, by washing it with warm water and a good neutral soap, such as castile or white toilet soap, and, if necessary, scrape it on the pulley side to remove dressing and dirt that may be caked there. Wash rapidly and under no circumstances permit the belt to become wet, as it will then stretch and slip and the cemented laps may become loosened. Caking of dressings is injurious to the belt and also causes it to run unevenly. Apply the dressing, which may be either liquid or solid at ordinary temperature, to the outside of the belt while it is at rest, and allow it to soak in overnight. It should be applied very evenly and rubbed

in with cotton waste, a piece of felt, or some similar material. If absolutely necessary, a very light dressing may be applied to the pulley side of the belt, using cotton waste or felt lightly greased with the dressing. Even distribution and penetration should be secured as far as it is possible to do so. Rosin or greases containing rosin weaken the belt and shorten its period of service. Excessive amounts of belt dressings cause undue stretching and loss of grip. Belts should never feel greasy or look more greasy than when they were installed. Because a little dressing is a good thing for belts it does not follow that more is better.



FIG. 13.—Effect of Proper Care on Leather Belting.

This belt, which has been kept in good condition, has run every day for 27 years in a country mill. Even now, when it breaks, it usually is where it has been riveted, and not where it is laced or glued.

BOOKBINDING LEATHER.

SELECTION.

Leather used for bookbinding must contain little if any mineral or oxalic acid, a small percentage of which will rot the leather in a few years.

Bookbinding leathers tanned with sumac or similar tanning materials are more durable than those tanned with hemlock bark or tanning materials of like nature.

CARE.

Bookbinding leathers have a tendency to dry out and become rather harsh, finally breaking at the hinge, if the leather along this line is not kept flexible by occasional greasing. For this purpose any high-grade vaseline or petroleum product, free from acids, may be used. The following directions for greasing bookbinding leathers are taken from the 1911 pamphlet on leather preservation issued by the Worcester County Law Library, Worcester, Mass.

The work should be done in a well-lighted, airy place, preferably during the summer months when the windows can be open to let in the outside air to supplement artificial heat for drying. Place the book, back up, on a table having a smooth top and anoint the back, rubbing the vaseline well into the grain of the leather. Next treat the sides and edges, being careful not to get any vaseline on the paper. Use small quantities of vaseline and rub them in well, with a firm, flexible stroke. The first application usually is absorbed rapidly. Next apply a second lot and rub the leather down well as before. The back and edges of the back require more vaseline than the sides and front edges. Then place the book on a shelf to dry, which takes from 24 to 48 hours, and finally rub off all surplus grease.

Merely dabbing on the vaseline with a cloth and rubbing it off again, while better than no treatment, does not give good results. Neither is one application left to dry in by itself satisfactory. Light rubbing with cloth pads will not take the place of rubbing with the bare hand. It is better to start with a very small quantity and make several applications, according to the condition of the book, than to use too much vaseline at first.

MISCELLANEOUS LEATHER GOODS.

Almost every household has a number of articles made wholly or in part from leather, among which may be mentioned traveling bags and suit cases, shopping bags, purses, pocketbooks, wallets, and bill folds, brief cases, shawl straps, belts, gloves, and furniture upholstered in leather.

SELECTION.

Paying a higher price for leather of good quality is more economical than buying leather of inferior quality at a lower price. Buying from a reputable firm is a good rule for the average person who is unable to judge correctly the quality of finished leather articles or determine the kind of skins from which they are made. In the case of bags, folders, pocketbooks, brief cases, and other articles subject to abrasive wear, leather gives better service and retains its original appearance longer when it has a smooth, rather than an embossed, finish. Moreover, a close examination of a smooth-finish leather shows whether it is a grain or a split piece, an important thing to know, as the grain leather is more serviceable. In grain leather the many fine hair holes of the skin are apparent and their arrangement may serve to identify the skin.²

² An idea of the characteristic appearance (under slight magnification) of leather made from different kinds of skin may be obtained from U. S. Department of Agriculture, Bureau of Chemistry Circular 110, "Identification of Tanned Skins," sold by the Superintendent of Documents, Government Printing Office, Washington, D. C., for 5 cents a copy.

In the case of articles made of undyed russet leather, the darker shades usually give the best service. Light-colored leather soon becomes soiled and, as a rule, has been bleached by chemicals which may be retained to its detriment.

CARE.

Leather articles of this type should not be allowed to get wet. It is best to carry billfolds, wallets, and pocketbooks where they will be subjected to the least amount of rubbing and bending and least exposed to perspiration. Leather articles should not be kept in very warm places, as leather that has become excessively dry is harsh, cracky, and easily scuffed. The life of uncoated grain leathers may be preserved and drying out prevented by the occasional application of a good saddle soap or leather dressing. The mixture described under formula 1, page 12, if thinned down, while in a molten condition, with an equal volume of turpentine and used cold, or, perhaps more conveniently, castor oil or vaseline may be used for traveling bags, suit cases, brief cases, and upholstery leather. Russet leather, however, is somewhat darkened by such treatment. Apply a little dressing on a piece of soft cloth, work it in well with the hands until thoroughly distributed, and then rub the cloth lightly and evenly over the entire surface. After a short interval rub the article briskly with a clean, dry cloth to remove any excess of grease.

Oils and greases should never be used on glazed, enameled, or coated leathers, as the coating thus treated tends to become soft and sticky. For such leather, which is sometimes used for carriage and automobile upholstery, special dressings, designed to renew the finish and improve the appearance, can be bought on the market under the name of top and seat dressings.

Sometimes it is desirable to improve the appearance of worn leather articles by the application of a coat of dye. This should be done before any dressing has been applied and preferably after the leather has been cleaned by brushing or rubbing very lightly with a small cloth moistened with gasoline. Leather dyes, sold primarily for dyeing shoes, are often expensive. Dyes for brown and black upholstery and other leather may be prepared according to the following formulas:

Brown dye.—Dissolve in $1\frac{1}{2}$ pints of water $\frac{1}{4}$ ounce of Bismarck brown, 3 grains of ethyl green (brilliant or emerald green) crystals, and $\frac{1}{4}$ ounce of phosphine (leather yellow).

Black dye.—Dissolve in $1\frac{1}{2}$ pints of water $\frac{1}{2}$ ounce of water-soluble nigrosine.

Commercial leather dyes which contain nitrobenzene, a poisonous chemical characterized by an almond-like odor, should be used only

where the ventilation is good and never should be applied to shoes on the feet.

Soiled leather may be cleaned by applying saddle soap with a moist sponge and rubbing with a clean, dry cloth. Oxalic acid, which is used sometimes alone and sometimes in preparations for cleaning and bleaching leather, is injurious. Although it is almost impossible to remove oil and grease spots from leather, in some cases satisfactory results may be obtained by coating the spot with a thick and quick drying rubber cement and peeling off the coating when it is almost dry. It may be necessary to repeat this operation several times.

MILDEWING OF LEATHER.

Any leather article is almost certain to mildew if kept in a warm, damp, and dark place, such as a closet, cellar, or stable. This mildewing probably will not reduce seriously the serviceability of the article, unless it is allowed to remain too long. It may, however, change the color appreciably, thus injuring the appearance. The simplest way to prevent mildewing is to keep the leather in a well-ventilated, dry, well-lighted place, preferably one exposed to the sunlight. When mildew develops, it should be washed off with soap and warm water, or simply wiped off with a moist cloth, drying the leather well afterwards. These simple measures are more satisfactory than the application in the home of preparations designed to prevent the growth of mildew.

